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ABSTRACT

The Assessment of Phonological Disabilities measure was administered to 39 normally developing children and 10 speech-delayed children who were Spanish speaking, of Puerto Rican descent, and ranging in age from 3 to 4. Data were analyzed by comparing phonological processes against the "standard referent" and the "Puerto Rican referent." The following syllabic and substitution processes were examined: final consonant deletion, velar fronting, stopping, palatal fronting, liquid simplification, assimilation, cluster reduction, and weak syllable deletion. Results with the normally developing children indicated that taking dialect into account alters the results with all syllabic processes. Results were altered most dramatically with final consonant deletion and liquid simplification. Results with the speech-delayed children indicated that taking dialect into consideration alters results with a majority of the phonological processes, most dramatically with final consonant deletion. The remediation process for two commonly occurring syllabic processes (initial consonant deletion and weak syllable deletion was then analyzed with six of the children. (JDD)

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THE DEVELOPMENT AND TREATMENT OF PHONOLOGICAL PROCESSES IN SPANISH SPEAKING CHILDREN

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INTRODUCTION

It has been estimated that there are approximately 19 million Latinos residing in the United States (Lombard and Peters, 1981). Of that number, about 2.8 million are either in elementary or secondary schools and thought to be either limited English speaking or non-English speaking (U.S. Bureau of the Census, 1981). Currently, it is unknown how many of these children exhibit speech and/or language delays.

When examining an English-speaking child, it is possible to compare his/her performance against a normative referent and thus to determine whether that child is delayed in some area of speech and language. This procedure, which is taken for granted for native English-speaking children, is nearly impossible for a child whose native language is Spanish. This is due, in part, to a lack of available normative data on the development of speech and language skills in this population. There exists a meager data base on the use of phonological processes by Spanish-speaking children (cf. Cabello, 1986; Fantini, 1974; Gonzalez, 1981; Macken, 1978). Furthermore, with the exception of the Cabello study, the others were designed to obtain phonetic not phonological data. In addition, the sample sizes for the Cabello, Macken and Fantini studies were quite small: 5, 1, and 1 subject(s), respectively. Further complicating phonological knowledge of Spanish-speakers is dialect. The substantial differences across the various dialects of Spanish further complicate this process. In English, dialectal variations are generally defined by modifications of vowels. However, in Spanish, dialectal changes primarily affect consonants rather than vowels.

In addition to the limited data on normal speech processes of Spanish-speakers, is the negligible information regarding the evidence of phonological processes by speech-delayed Spanish-speaking children. To date, few studies have even mentioned this population (Cabello, 1986).

PHONOLOGICAL PROCESSES IN NORMALLY DEVELOPING AND SPEECH DELAYED SPANISH-SPEAKING CHILDREN

Phonological processes used by normally-developing Spanish-speaking children will be discussed with reference to the effect of dialect. It will be shown that dialect must be accounted for in the assessment of phonological processes of Spanish-speaking children. Data will also be presented on the use of phonological processes by preschool, speech-delayed Spanish-speaking children. Results will be presented by age, phonological process type and sex of the child. By presenting data on the use of phonological processes with and without accounting for dialect, it will be shown that it is obligatory to take dialect into account when examining Spanish-speaking children.

To measure the evidence of phonological processes in normally developing and speech-delayed, Spanish-speaking children of Puerto Rican descent, the Assessment of Phonological Disabilities (APD), (Iglesias, 1978) assessing simple CVCV forms, clusters and multi-syllabic words was administered to 39 normally developing children ranging in age from 3;0-4;11 and 10 speech delayed children ranging in age from 3;6-4;11. The test was administered once to each subject and transcribed by the first author at the time of administration using the International Phonetic Alphabet.

Subjects

The 39 normally developing and 10 speech-delayed (5 male and 5 female) children of Puerto Rican descent included in the study were

enrolled in one of two Head Start programs in Philadelphia, Pennsylvania. The normally developing children ranged in age from 3;0-4;11 and the speech-delayed children ranged in age from 3;6-4;11 at the time of administration. The children were divided into the following age groups:

Normally Developing Children		Speech-Delayed Children	
3;0 - 3;5	(n= 5)	3;6-3;11	(n=3)
3;6 - 3;11	(n= 4)	4;0-4;6	(n=6)
4;0 - 4;5	(n= 20)	4;6-4;11	(n=1)
4;6 - 4;11	(n= 10)		

Hearing was screened for each child and found to be within normal limits for all subjects included in the study.

Administration of the Measurement

Each subject was assessed individually and directly in one twenty to thirty minute session in Spanish by the first author, a fluent speaker of the language. The examiner prompted each separate response by asking, "Que es esto?" (What is this?). If this was not enough to elicit the name of the item, the examiner would describe the object ("it is used for ___") in order to elicit the desired response. If the child would not or could not name the item, the examiner used imitation, naming the item and then asking the child to name it.

Analysis of the Data

The data were analyzed to identify the phonological processes targeted by the APD that were evident in the speech of the child. A mean percentage-of-occurrence was tabulated for each phonological

process described on the Natural Process Analysis (NPA) (Shriberg and Kwiatkowski, 1980). Since these children use the Puerto Rican dialect of Spanish, the data were analyzed in the following manner: (a) not taking dialect into account (i.e., comparison against the "standard referent") and (b) taking dialect features into consideration (i.e., comparison against the "Puerto Rican referent").

The following processes are described on the NPA and are accounted for in this study: final consonant deletion, velar fronting, stopping, palatal fronting, liquid simplification, assimilation, cluster reduction and weak syllable deletion. Initial consonant deletion though not included on the NPA was accounted for in the data of speech-delayed children.

The data are presented within the following sections:

Syllabic Processes	Substitution Processes
Final Consonant Deletion	Velar Fronting
Cluster Reduction	Stopping
Weak Syllable Deletion	Palatal Fronting
Initial Consonant Deletion	Liquid Simplification
	Assimilation

The mean percentage-of-occurrence of each process across all subjects and within each group is presented. In addition, for the speech-delayed children, the results are discussed and an explanation offered with respect to the difference in results between (a) males and females and (b) between phonologically delayed Spanish speakers and their normally developing counterparts.

CONCLUSIONS

Normally Developing Children

The purpose of this study was to provide normative data on the evidence of phonological processes by testing thirty nine normally-developing, Spanish-speakers of Puerto Rican descent, ages 3;0-4;11. Results of the study permit the following conclusions:

1. For syllabic processes, taking dialect into account alters the results with all processes and most dramatically with final consonant deletion and liquid simplification.
2. Final consonant deletion is pervasive, exhibited greater than 10% of the time, (a) within all age groups and across all subjects when compared against the standard referent and (b) within the 3;0-3;5 and 3;6-3;11 age groups when compared against the Puerto Rican referent.
3. Cluster reduction is pervasive (a) within the 3;0-3;5 and 4;0-4;5 age groups when compared against the standard referent and (b) within the 3;0-3;5 age group when compared against the Puerto Rican referent.
4. Weak syllable deletion is not pervasive for any age group when compared against either the standard or Puerto Rican referent.
5. For substitution processes, liquid simplification (a) is pervasive within all age groups when compared with the standard referent and (b) is NOT pervasive with any age group when compared with the Puerto Rican referent.
6. Velar fronting, stopping, palatal fronting and assimilation are not pervasive within any age group when compared against

either the standard or Puerto Rican referent.

7. In conclusion, dialect must be taken into account when assessing the phonology of Spanish-speaking children. Also, it seems that Spanish-speaking children have suppressed the majority of phonological processes by the time they reach three and one half years of age.

Speech-Delayed Children

The purpose of this study was to provide data on the evidence of phonological processes exhibited by 10 delayed Spanish speaking children, ages 3:6-4:11, of Puerto Rican descent. The results of the study permit the following conclusions:

1. Taking dialect into consideration alters the results with a majority of the processes, most dramatically with final consonant deletion.
2. Across all subjects, initial consonant deletion, liquid simplification, stopping and final consonant deletion are pervasive when compared against the standard referent. When compared against the Puerto Rican referent, initial consonant deletion, liquid simplification and stopping are pervasive.
3. Three (3) year olds with delayed speech use syllabic processes a higher percentage of the time than substitution processes. However, four year olds use substitution processes a higher percentage of the time than syllabic processes.
4. Compared with the Puerto Rican referent, boys use the following processes pervasively: initial consonant deletion,

weak syllable deletion and liquid simplification. Compared against the same referent, girls use the following processes pervasively: cluster reduction, stopping and liquid simplification.

5. Compared against the Puerto Rican referent, boys exhibit greater use of syllabic vs. substitution processes than girls. The converse is true for girls.
6. Compared with normally developing children, delayed speakers use more processes pervasively within all age groups and across all subjects. In addition, delayed speakers exhibit greater use of both syllabic and substitution processes than normally developing children.

REMEDIATION OF PHONOLOGICAL PROCESSES

Description of the Task

Preliminary data were gathered to document the process of treatment and its subsequent stages for two commonly occurring syllabic processes, initial consonant deletion and weak syllable deletion. For each process remediated, data are presented showing the pattern of phonological change throughout the remediation process.

Subjects

The 6 children (3 male and 3 female) of Puerto Rican descent included in the study were enrolled in one of two Head Start programs in Philadelphia, Pennsylvania. The children ranged in age from 3;6-4;11. Hearing was screened for each child and found to be within normal limits.

Analysis of the Data

To measure the stages of phonological remediation, the clinician targeted the syllabic phonological processes, initial consonant deletion and weak syllable deletion, which were highly evident in the speech of the children. The S-I-S (spontaneous-imitation-spontaneous) method of production (Iglesias, 1979) was employed to elicit 10-15 words per week for each process from the child and thus decrease his or her use of phonological processes. To employ the S-I-S method, the clinician presented the child with illustrations of words containing

the targeted processes. If the child accurately produced the target, the next word was elicited. However, if the production was inaccurate, the clinician modeled the target word for the child to imitate. Subsequently, the child produced a delayed imitation production of the word. Productions are rewarded differentially as they more closely approximate the desired target. Using IPA symbols, the clinician recorded each production under the appropriate category: (S, I, or S).

The use of initial consonant deletion was accounted for by dividing the children's initial consonant productions into one of five levels, I.: no consonant produced; II.: any consonant produced; III.: a consonant containing the manner or place of articulation of the target; IV.: a consonant containing the manner or place and voicing of the target; V.: the target consonant. A mean percentage-of-occurrence was tabulated by spontaneous and imitated responses throughout each week and the remediation process overall.

The use of weak syllable deletion was accounted for by the calculation of a mean percentage-of-occurrence for 3, 4, and 5 syllable words by spontaneous and imitated responses throughout each week and the remediation process overall.

Conclusions

The purpose of this study was to provide data on the process of phonological treatment and its subsequent stages in 6 phonologically delayed Spanish speaking children of Puerto Rican descent. The results of the study permit the following conclusions:

1. For initial consonant deletion, children move from level I responses to level II and IV responses then to level V responses in a matter of weeks. Level III responses are not highly evident. At the start of remediation, children use a high proportion of words without any initial consonant at all; in a few weeks, they are producing initial consonants (though not always the target) 100% of the time.
2. For weak syllable deletion, children move quickly to accurate productions of 3 and 5 syllable words; 4 syllable words show more fluctuation in their accuracy. At the end of remediation, children are producing 3 and 5 syllable words with great accuracy. Four syllable words tend to be produced as three syllable words both at the beginning and end of the remediation process.

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